

Flood Plain Mapping Issues Associated With SF 2293

Amendments to 455B.200B include a requirement that the department shall “designate by rule each one hundred year floodplain in this state according to the location of the 100 year flood plain.”

The Iowa DNR, and predecessor agencies, have been regulating development in flood plains since 1957. This has often been accomplished by staff determining, on a case-by-case basis, whether or not a proposed project site was located in the 100 year flood plain and, if so, conducting a site analysis to determine the required protection level. The legislature has never allocated funding for any of these agencies to conduct statewide detailed flood plain mapping. In fact, there were essentially no flood hazard maps for the state until the first flood maps produced by the Federal Emergency Management Agency (FEMA) for the National Flood Insurance Program (NFIP) in the mid-1970's.

The following section includes a description of the types and extent of flood mapping currently available for the state of Iowa.

Types of Flood Maps Available in Iowa

Approximate Study Counties: This first generation of flood maps were produced by FEMA for the National Flood Insurance Program (NFIP) starting in the mid-1970's. These maps, known as Flood Hazard Boundary Maps (See Figure 1), show the “approximate” location of the 100 yr. flood plain. Most of these maps were intended to be temporary and were to be replaced by more detailed studies (described below). However, budget cuts in the NFIP in the mid-1980's resulted in many of these maps becoming permanent.

The flood hazard areas shown on these maps were normally delineated from standard 10 ft. – 20 ft. interval United States Geological Survey (USGS) topographic maps using very little actual hydraulic data. For this reason, these maps can be very inaccurate.

The unincorporated portions of the following 43 counties have been mapped using only approximate methods.

Allamakee, Benton, Boone, Buchanan, Buena Vista, Butler, Carroll, Cass, Cedar, Cerro Gordo, Cherokee, Chickasaw, Clay, Clayton, Clinton, Crawford, Delaware, Emmet, Fayette, Floyd, Franklin, Fremont, Greene, Guthrie, Hancock, Iowa, Jackson, Jasper, Jones, Keokuk, Kossuth, Lyon, Madison, Mahaska, Marion, Mitchell, Palo Alto, Shelby, Sioux, Van Buren, Wapello, Webster, Winnebago.

Detailed Study Counties: The production of detailed Flood Insurance Studies (FIS) requires a large amount of topographic, hydrologic and hydraulic data. Surveyed valley cross-sections are used to create a mathematical hydraulic model of the river system, resulting in a 100 year flood profile. This flood profile is then used to identify those areas that would be inundated by the 100 year frequency flood (See Figure 2).

Technical innovations over the past 2 decades have improved the processes associated with data collection, modeling and mapping. However, producing such maps is still extremely expensive. FEMA estimates that the average price associated with producing a detailed FIS is over \$12,000 per stream mile mapped.

It should be noted that no county has all its streams studied in detail. Because of the expense of the detailed study process, the majority of the streams in detailed study counties are mapped using approximate methods. Several counties have only one of their streams mapped using detailed study methods.

The unincorporated portion of each of the following 22 counties has at least one stream mapped using the detailed methods outlined above – with the remainder of each county mapped using the previously discussed “approximate” methods:

Black Hawk, Bremer, Dallas, Des Moines, Dickinson, Dubuque, Harrison, Johnson, Lee, Linn, Louisa, Marshall, Mills, Monona, Muscatine, Plymouth, Polk, Pottawattamie, Scott, Story, Warren, Woodbury.

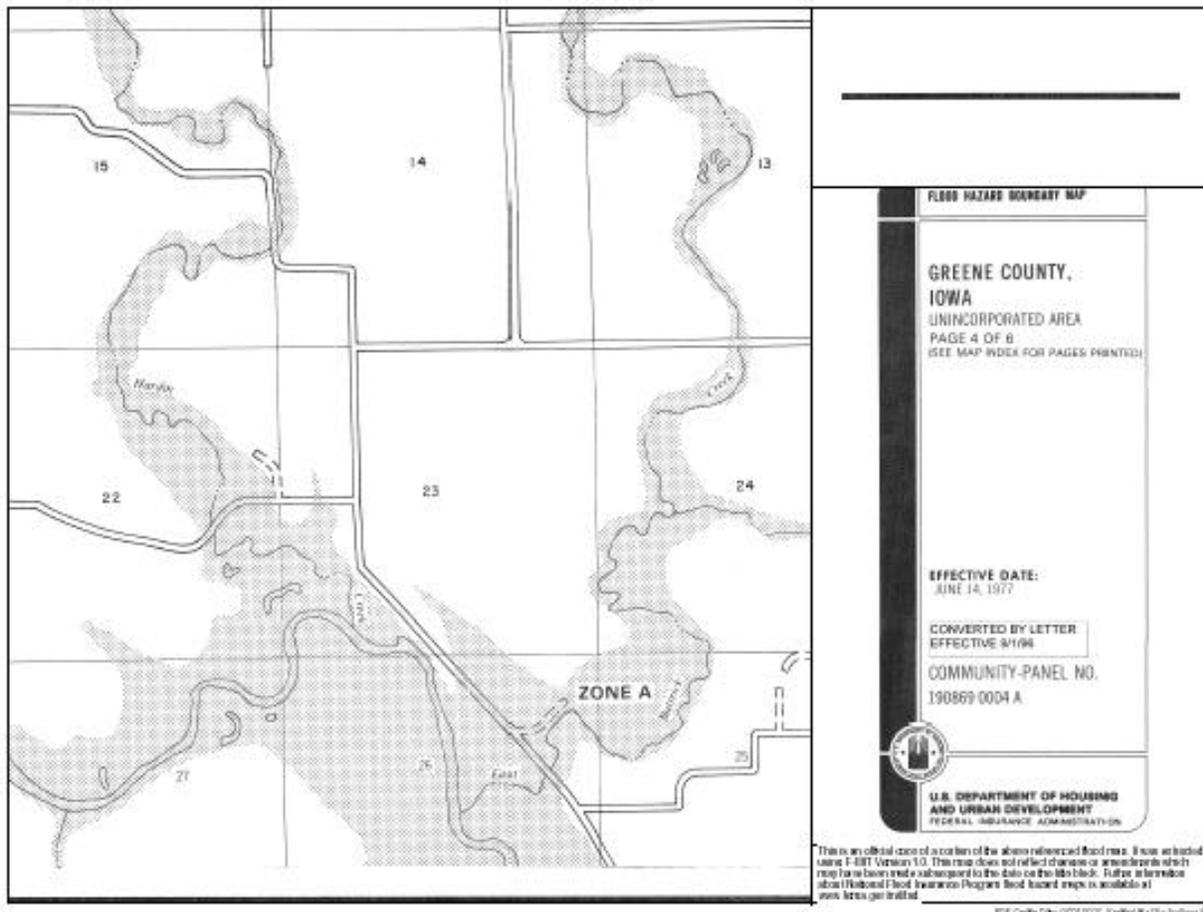


Figure 1
Example of Approximate Flood Map

Unmapped and Partially Mapped Counties: When FEMA began its mapping initiative in the mid-1970's, there were still a number of counties for which the USGS had not updated its topographic maps. FEMA did not attempt to create flood maps for areas where the more modern 1:24000 scale mapping did not exist. For this reason, a number of counties were left either unmapped or partially mapped.

The following 18 counties contain areas for which there is no flood plain mapping:

Buena Vista, Carroll, Cass, Cedar, Chickasaw, Clinton, Crawford, Fayette, Fremont, Greene, Jackson, Jasper, Keokuk, Kossuth, Mahaska, Palo Alto, Wapello, Webster

The unincorporated portions of the following 34 counties are currently unmapped:

Adair, Adams, Appanoose, Audubon, Calhoun, Clarke, Davis, Decatur, Grundy, Hamilton, Hardin, Henry, Howard, Humboldt, Ida, Jefferson, Lucas, Monroe, Montgomery, O'Brien, Osceola, Page, Pocahontas, Poweshiek, Ringgold, Sac, Tama, Taylor, Union, Washington, Wayne, Winneshiek, Worth, Wright.

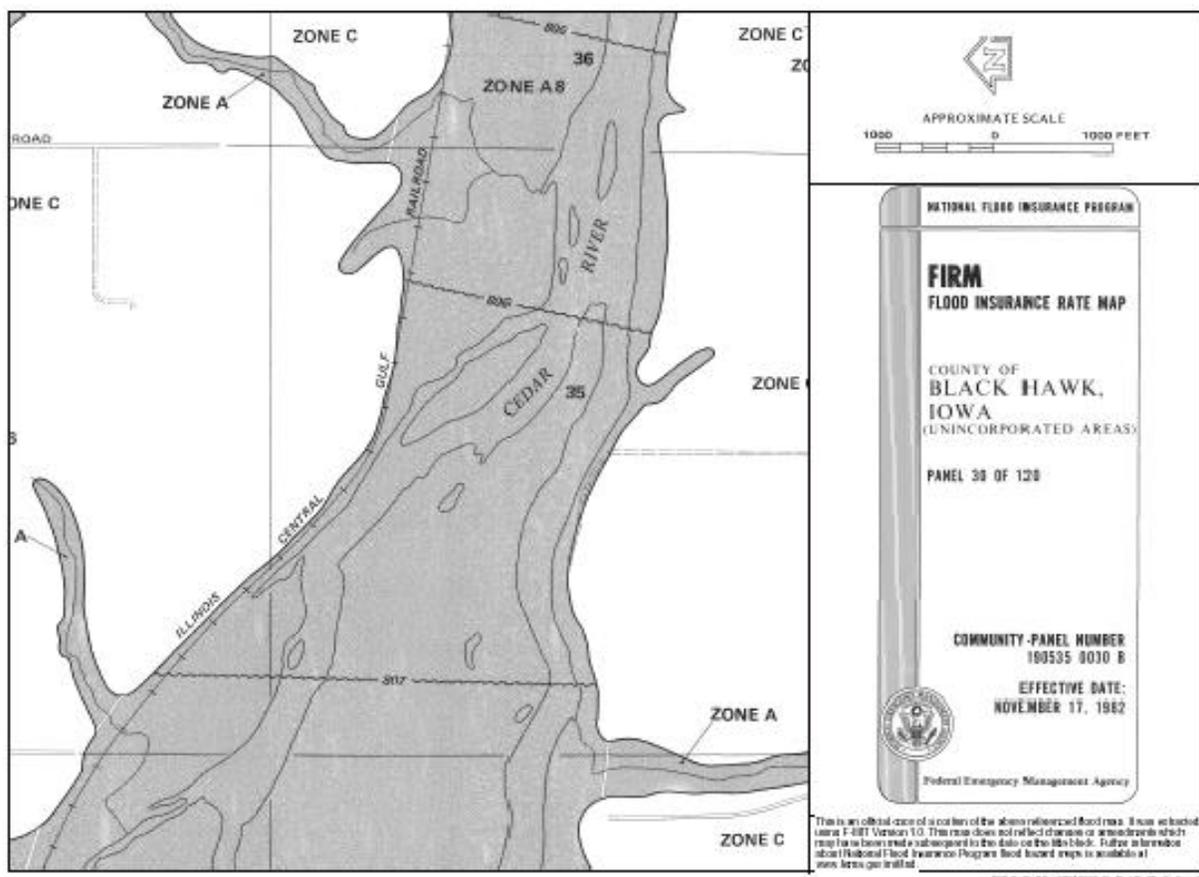


Figure 2
Example of Detailed Flood Map

Digital Flood Maps (DFIRM's): FEMA has not yet produced any digital flood maps for Iowa. However, it appears that several current mapping projects will result in digital coverage.

Early efforts by FEMA to digitize “paper” flood maps (known as Q3 coverage) showed that paper maps do not convert easily to digital coverage. It was not uncommon to find that the digital flood plain coverage, when overlaid on a USGS topographic map, did not always align with the stream. As a result, the Q3 digital maps are of no practical value as the paper maps must be used to make a defensible determination as to whether a proposed project is in the flood plain.

While it is possible to produce digital flood coverage that corresponds with the existing paper flood maps, the process is expensive and time consuming – especially in light of the fact that many of the existing maps are of poor quality and need to be replaced. The estimated cost of digitizing and correcting a paper map is \$1500 per map panel. The typical Iowa county has between 6 and 15 map panels (excluding map panels for cities).

It has been suggested by some that Soil Survey Maps could be used to identify the 100 year flood plain. Our experience shows that, while soil maps might be used for a very “rough approximation” of the 100 year floodplain limits, flood plain soils do not necessarily correspond with 100 year flood plains identified using elevation based mapping methods. Therefore, they would not be adequate for the purpose of delineating the 100 year floodplain as called for in SF 2293.

In Summary: Approximately 1/3 of the state is currently unmapped and 18 counties are only partially mapped. Also, at least 43% of the state’s current flood maps are of poor quality.

Meeting the State s Flood Plain Mapping Needs

Starting in the mid-1980’s, Congress took the NFIP “off-budget” - in other words, all funding for the program, including flood plain mapping, was to come from revenues remaining after the collection of flood insurance premiums and payment of claims. For most of the past decade, FEMA’s mapping budget has been approximately \$60 million. In recent years, the amount of money FEMA has dedicated to producing flood maps for Iowa has been less than \$200, 000 per year.

For the first time in decades, Congress is now considering additional funding for FEMA’s Flood Map Modernization Program. If the legislation is approved, it will provide an additional \$300 million per year, for each of the next 4 years, for flood plain mapping projects nationwide. We have been told to expect up to \$4 million a year to be allocated to mapping projects in Iowa.

The Flood Plain Management staff has been working since April to prioritize the mapping needs of all 99 counties. A list of the first year funding priorities is due to FEMA before the middle of July. The short timeline, and not knowing the exact amount

or term of funding that will be available, has made this ranking process extremely difficult.

Adding to the difficulty of the task are requirements placed on the process by FEMA and Office of Management and Budget (OMB). OMB's guidelines specify several goals that must be met in the types of products provided and communities mapped. They also require an average 20% cost share for all mapping projects. And so, communities that are able to cost share their mapping projects will likely receive priority ranking in order to satisfy this requirement. It is hoped that the cost share provided by those communities will help offset the requirements for those communities that are unable (or unwilling) to contribute to the cost of producing their flood map.

If adequate funding is provided to FEMA through this current legislation, it may be possible to provide reasonably accurate flood maps for the entire state within the next 5 years. It will be one of our goals to acquire digital flood plain mapping for as much of the state as possible.

Delineation of Flood Plains By Rule

Assuming adequate and accurate flood mapping were available for the state, there are a number of issues and obstacles that must be addressed regarding the delineation of flood plains by rule.

- How will the delineation of flood plains by rule be accomplished? To compile all the flood plain information available into "one" map would be a major undertaking.
- There is some possibility we could adopt the existing NFIP/FEMA maps by reference. However, to do this, we would likely have to reference each individual map panel. There are currently over 1200 individual map panels for the state of Iowa. This number will increase as the maps are produced for the unmapped counties.
- Are we required to delineate flood plains by rule for the entire state at the same time? Or, can we start with those areas where we have sufficient mapping and add other flood plains as information becomes available?
- Regardless of how the process is accomplished, it is safe to assume that the flood plains delineated by rule will be based on flood hazard information provided by NFIP/FEMA maps. However, FEMA is constantly updating and revising their flood maps. How do we recognize these changes in FEMA flood maps in respect to the flood plains delineated by rule? This is of particular concern if we adopt the FEMA maps by reference. Will we be forced to go through the rule making process every time an effective flood map panel is changed by FEMA?
- While some of the NFIP/FEMA map products are very good, they are not perfect. FEMA realizes this and provides a process by which an effective flood map can be revised by letter (known as a Letter of Map Amendment, or LOMA) when a property owner provides information that demonstrates that natural ground elevations on the property are above the 100 yr. flood elevation. Shouldn't our process of delineating flood plains by rule include a similar provision?

Procedures Used Until Flood Plains Are Delineated By Rule

Until the state's flood plains are delineated by rule, the law requires that anyone wishing to "construct confinement feeding operation structure on land that contains a soil type classified as alluvial" must request a declaratory order from the department as to whether or not the property is located in the 100 yr. flood plain.

A process has been created whereby all such requests will first be screened by the department's GIS specialists to determine if the site of the proposed operation is in fact located on soils classified as having a frequent flood occurrence. If so, the GIS specialists will attempt to determine if, by reason of topography (e.g., the site is 40 ft. above the top of stream bank) the site can be safely determined to be outside the 100 yr. flood plain. If the information available is not sufficient for such a determination, Flood Plain Management staff will be asked to make a determination.

One of the issues that has not yet been addressed with this process is as follows: It is often possible for Flood Plain staff to determine whether a site is located in the 100 yr. flood plain using sources such as topographic maps, FEMA flood maps, published experienced flood profiles, and past projects approved in the vicinity. However, there are situations where additional information is needed for such a determination. In its regulation of most types of flood plain development, the department has the ability to request additional information such as surveyed valley cross-sections, site elevations, etc. It has not yet been determined if – or how – the department could request such information in the process of reviewing requests for these declaratory orders.

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